FRBSF Weekly Letter

April 10, 1987

Junk Bonds: Why Now?

One of the most visible developments in finance markets in recent years has been the rapid growth in the issuance of low-rated bonds to finance corporate activity. The quarterly volume of new debt issues with a Moody's rating below Baa (referred to variously as "noninvestment grade", "high yield", or "junk" bonds) amounted to only $380 million as recently as the first quarter of 1982, but had grown to $11 billion by the second quarter of 1986. Presently, junk bond financing represents 20 to 30 percent of all corporate debt issuance.

The increasing use of junk bonds is the subject of vigorous public and policymaker debate for a number of reasons. Some observers are concerned because some of these high yield — and high risk — bonds are held in the portfolios of thrift institutions, life insurance companies, and pension funds where they may put the income of investors at risk. There is also concern that junk bonds facilitate corporate takeovers, an activity that some consider inherently undesirable. Finally, there is the concern that the promised yields of junk bonds will fail to materialize and that the defaults will reverberate through the capital markets.

By understanding the reasons for the recent popularity of junk bonds, it should be possible to put these concerns in perspective. This *Letter* reports on an examination currently underway at this Bank of the behavior of the junk bond market. We find that recent changes in the structure of personal and corporate tax policy may be an important stimulant to debt financing in general and the junk bond market in particular.

Conventional explanations

Although numerous explanations have been offered for the recent surge in junk bond issuance, most of these explanations do not survive close inspection. One explanation, for example, is that investment banks and brokerage firms recently discovered an "untapped" investor interest in high yield, high risk debt. It is true that investment banks have been the vehicle through which junk bond debt has been issued, and that they have facilitated trading by maintaining markets in junk bonds. However, since it is unlikely that long latent investor demand would go unexploited, this explanation does not account for why the market has grown so rapidly in recent years.

A second conventional explanation is that improvements in information technology now make it economical to evaluate investments in smaller and high-risk firms. Combined with the growth of investment portfolios of sufficient scale to permit diversified holdings of low-rated debt, these improvements are seen as making the issuance of junk bonds more feasible. Although recent improvements in technology may well be contributing to the development of the junk bond market, they cannot offer a complete explanation since junk bonds also were common in the first four decades of this century. Indeed, noninvestment grade debt averaged about 35 percent of all debt issued between 1910 and 1947.

A third explanation for the recent jump in junk bond issuance is that investor preferences have changed in recent years and, in particular, that investors now are less adverse to holding corporate securities. This argument is difficult to disprove since it is impossible to observe investor preferences directly. But it leaves unexplained why a similar surge in *equity* issuance has not occurred. Certain propositions in finance theory argue that a firm's debt and equity issues offer the same risk-return opportunities on the margin and equity certainty is a liquid security. In fact, net new equity issuance in recent years has actually turned sharply negative at the same time that debt financing generally and junk bond financing in particular have surged (Chart 1).

Debt vs. equity in the firm
There is an alternative explanation for the resurgence of junk debt financing that also is consistent with the dramatic decline of net new equity issuance and increased debt issuance generally. This explanation draws on the theory of the capital structure of the firm — that is, the amount of debt versus equity used by a firm to finance its assets.

According to this theory, firms select a capital structure that maximizes their value (the value of their equity). Economists Modigliani and Miller have shown that, in the absence of taxes, bankruptcy costs, and other sources of distortion, the value of the firm in theory is independent of its capital structure. In the real world, however, distortions exist and have been postulated to be the source of a firm's preference for one capital structure over another.

Taxes are particularly likely to influence capital structure. Both corporate and individual income is taxed in our economy. A firm is taxed on its gross income *minus* (among other things) interest payments on its debt. Since interest expense reduces corporate tax liability, it provides a "tax shield" for the corporation's income, creating a bias in favor of debt financing, everything else being equal. These interest payments are, however, income to individuals in the economy and are taxed at the personal income tax rate.

If the corporation were to choose equity financing instead, it would forego the tax shield benefits of debt, but individual equity owners would enjoy income in the form of capital gains. Capital gains enjoy preferential tax treatment since personal tax obligations on such gains can be delayed until shares in the firm are sold and, until recently, were taxed at a lower rate than other income. This preferential treatment creates an offsetting bias in favor of equity finance.

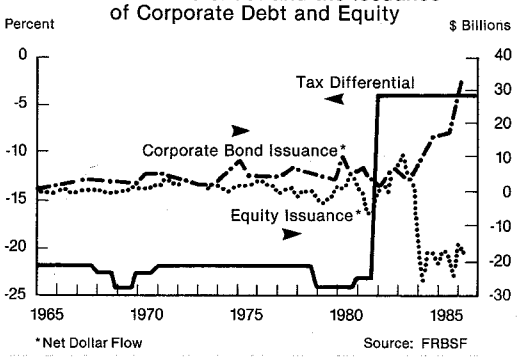
Corporate vs personal income tax rates
Whether a firm chooses a debt- or equity-heavy capital structure, therefore, may depend upon the relationship between corporate and personal tax structures. If the corporate tax rate were low relative to the personal tax rate, the value to the corporation of the "tax shield" offered by debt would be low, whereas the benefits to individuals of avoiding the personal tax liability associated with holding debt would be high. In such a case, the market (that is, the combined effect of firms and investors) would tend to prefer equity finance. If the reverse (corporate tax rates were high relative to personal tax rates) were true, there would be a tendency toward debt finance.

This simple view of the effect of taxes on corporate financial structure implies that firms will be either all equity or all debt financed depending upon relative corporate and personal tax rates. In reality, of course, we observe a mixture of debt and equity in the economy and variations in financial strategies across firms. Economist Merton Miller has argued that the existence of different personal tax rates for different individuals creates "clienteles" for both debt and equity that results in the observed mixture of debt and equity in the economy.

Another explanation for the mixture of debt and equity financing is that not all firms can take full advantage of debt-related tax shields. For example, a firm for which tax shields are of no value, such as one with low current income (as is the case with start-up firms), would prefer equity financing regardless of the tax structure. Firms with high income and sufficient sources of tax shields not related to debt (such as high depreciation allowances, which are deductible from the corporation's income for tax purposes) also would prefer equity financing. Thus, the ability to exploit debt-related tax shields and, hence, the influence of tax policy on financial structure, varies somewhat across firms.

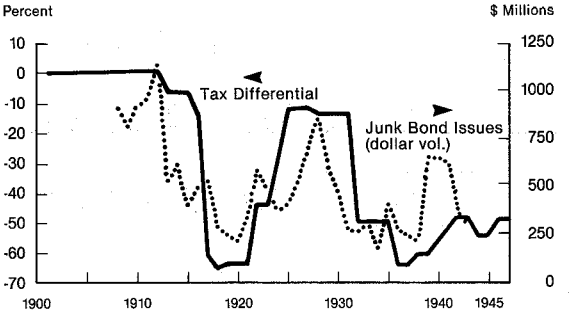
Tax policy and risky debt
The observation that high relative corporate tax rates increase the preference for debt ("high leverage") financing does not imply directly that there would be an increase in high risk, "junk" debt. For firms whose debt is on the borderline of being noninvestment grade, however, attempts to increase leverage would generate a deterioration of their debt rating. Thus, if all firms simultaneously desire higher leverage, overall corporate debt must be more risky on the margin. Increases in junk debt issuance therefore may naturally accompany attempts to increase overall leverage.

Chart 1
The Tax Differential and the Issuance of Corporate Debt and Equity



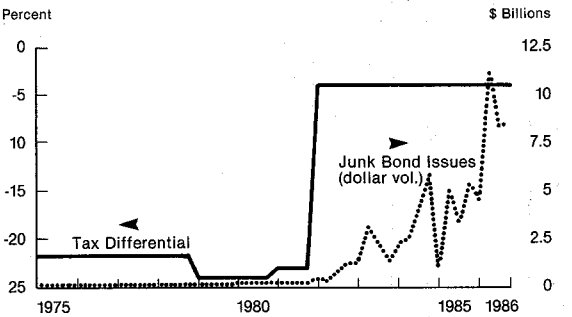
*Net Dollar Flow
Source: FRBSF

Chart 2A
The Tax Differential and Junk Bonds, 1900-47



Source: Hickman, FRBSF

Chart 2B
The Tax Differential and Junk Bonds, 1975-86



Source: FRBSF, IDD Inc.

A more complex argument that may be used to relate high-risk debt issuance to tax policy has been made by economists Eli Talmor, Joseph Zechner, and others. They point out that in the U.S. tax code, all payments to debtholders in excess of the market value of the debt at issuance are deductible and hence a potential source of a tax shield. High yield (high risk) debt by definition is debt whose promised payments are large relative to the initial market value. Hence, the greater the firm's leverage and the riskier the debt, the greater is the value of the tax shield of an additional dollar of debt. The riskier the debt, of course, the greater is the likelihood of default. It can be shown, however, that on balance the value of debt as a tax shield still can increase with the riskiness of the debt.

Empirical evidence and conclusions

Thus, if tax policy makes debt-related tax shields generally attractive, it also stimulates the issuance of risky debt. This proposition is demonstrated in the historical relationship between financing activity and the difference between the highest corporate and personal marginal tax rates (the "tax differential"). As Charts 2A and B illustrate, the volume of junk bond issuance does indeed appear to have risen and fallen with the tax differential, at least for the two periods for which junk bond data are available. Chart 1 shows that the tax differential also appears to be related to the very sharp decline in the net issuance of equity (and the increase in debt issuance) that has occurred in the last five years or so.

Although conventional explanations also may be useful in explaining the debt finance "boom" of recent years, the explanation offered here based on the theory of the capital structure of the firm is less *ad hoc*. In addition, it forecasts a particularly interesting implication of the tax reform embodied in the 1986 Tax Act. By 1988, the top marginal personal tax rate will be only 28 percent versus 34 percent for corporations — a tax differential of +6 percent. This will be the first positive tax differential since 1908 and the largest in the 80-year history of income taxation in the U.S. Our analysis suggests that this differential could be a powerful stimulus to continued debt issuance generally and the junk bond market in particular.

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BANKING DATA—TWELFTH FEDERAL RESERVE DISTRICT

(Dollar amounts in millions)

Selected Assets and Liabilities Large Commercial Banks	Amount Outstanding 3/18/87	Change from 3/11/87	Change from 3/19/86 Dollar	Change from 3/19/86 Percent[7]
Loans, Leases and Investments[1] [2]	204,474	792	471	0.2
Loans and Leases[1] [6]	183,877	1,111	− 1,338	− 0.7
Commercial and Industrial	54,032	439	246	0.4
Real estate	67,879	− 29	1,512	2.2
Loans to Individuals	37,228	75	− 3,584	− 8.7
Leases	5,441	− 19	− 213	− 3.7
U.S. Treasury and Agency Securities[2]	13,486	− 335	2,715	25.2
Other Securities[2]	7,112	17	− 905	− 11.2
Total Deposits	207,020	− 1,378	5,545	2.7
Demand Deposits	51,574	− 1,247	3,842	8.0
Demand Deposits Adjusted[3]	34,835	− 13,930	2,332	7.1
Other Transaction Balances[4]	19,439	− 122	4,110	26.8
Total Non-Transaction Balances[6]	136,007	− 8	− 2,408	− 1.7
Money Market Deposit Accounts—Total	46,776	58	957	2.0
Time Deposits in Amounts of $100,000 or more	32,495	− 22	− 5,761	− 15.0
Other Liabilities for Borrowed Money[5]	24,488	1,048	− 2,848	− 10.4

Two Week Averages of Daily Figures	Period ended 3/9/87	Period ended 2/23/87
Reserve Position, All Reporting Banks		
Excess Reserves (+)/Deficiency (−)	91	45
Borrowings	18	7
Net free reserves (+)/Net borrowed(−)	72	38

1 Includes loss reserves, unearned income, excludes interbank loans
2 Excludes trading account securities
3 Excludes U.S. government and depository institution deposits and cash items
4 ATS, NOW, Super NOW and savings accounts with telephone transfers
5 Includes borrowing via FRB, TT&L notes, Fed Funds, RPs and other sources
6 Includes items not shown separately
7 Annualized percent change